readily accessible to business men, and would be preferably in or close to the City rather than in the West End of London.
Henry Trimen

NOTES

The International Geodetic Conference will assemble in Berlin on October 20. Its principal business will be to deliberate on the best method of executing the resolutions arrived at at Rome and Washington in 1883 and 1884 respecting the actual measurement of a degree on the earth's surface, and likewise in reference to a scientific survey of the European continent. The adoption by all nations of Greenwich as the first meridian, in accordance with the decision taken at Washington, is to be strictly enforced in practice. The introduction of international normal time, on the other hand, has had to be postponed, owing to insuperable practical difficulties connected with ordinary business life. In order to promote the project of any international survey of the entire globe, it is proposed to establish a Central Geodetic Office in Berlin.

The Association for the Improvement of Geometrical Teaching has revised its "Syllabus of Elementary Geometrical Conics," and is about to publish the same, with three figures lettered in accordance with the enunciations of the Syllabus. The work will be interleaved to allow of teachers and students supplying their own proofs, and will, it is hoped, appear early in November. Messrs. Swan Sonnenschein are the publishers.

The Bombay Government has just issued a long resolution on the subject of technical education, which is one of special importance to India. The resolution lays down the outlines of the scheme which it favours under three heads—agriculture, art, and mechanical industries. It proposes that the College of Science at Poonah should be a central institution for the teaching of higher agriculture, and that local classes and schools should be established throughout the province under the supervision of district officers and of the Educational Department. The Jamsetjee Jeejeebhoy School of Art in Bombay is to be the centre of Government efforts for the purpose of art teaching, and a report is called for as to the propriety of obtaining additional teaching. The question whether a technological institute for mechanical industries should be established is discussed at some length, and the Government expresses the opinion that the time for doing so has not yet come. Meanwhile, it is suggested that the Committee of the Ripon Memorial Fund should form itself into an a sociation for promoting technical education in Bombay city, the Government promising to give it the utmost possible aid. The main dependence of other parts of the province must be upon the high schools for elementary science, and upon such institutions as may be started by means of local efforts. The resolution concludes by saying that the scheme is not academic, but that it is meant to enhance the well-being of the people at large by giving increased employment to labour and capital, and by cementing harmonious relations between them.

The International Congress of Orientalists was opened at Vienna on the 27th inst., under the presidency of the Archduke Rénier. This is the seventh Congress of this body, the previous ones having been held at Paris in 1873, at London in 1874, St. Petersburg in 1876, Florence in 1878, Berlin in 1881, and Leyden in 1883. The Austrian Minister of Public Instruction welcomed the members, of whom there were about 300, in the name of the Government.

Dr. Schweinfurth has, in the interests of science, addressed to all Europeans, especially physicians, residing in Egypt, an inquiry as to whether, so far as they are aware, families of Northern origin settling in Egypt do, or do not, die out within three generations, or whether the race is capable of being perpetuated beyond that limit.

We are requested to announce that the seventh annual Cryptogamic and Botanical Meeting of the Essex Field Club will be held on Friday and Saturday, October 15 and 16, in Epping Forest, the head-quarters for the day being at Buckhurst Hill. A large number of well-known botanists have promised to take part in the meeting, and the naming and arrangement of the specimens collected will be in the hands of Dr. Cooke, Rev. Canon Du Port, Dr. Wharton, Mr. Worthington Smith, and other fungologists. Botanists and others desirous of attending should communicate with the Hon. Secretary, Buckhurst Hill, Essex.

The U.S. Hydrographic Office has received the following note:—"August 31, at 9.45 p.m., the steamer *City of Palatka*, Capt. Vögel, when a mile and a half north of Martin's industry lightship (off the coast, south of Charleston), in eight fathoms and a half of water, experienced a terrible rumbling sensation, lasting a minute and a half. There was quite a heavy sea from the south-east after leaving Charleston Bar at 5.30 p.m. When this rumbling sensation took place the wave-motion ceased. It was a perfect calm during the rumbling; after that the usual motion of the south-east swell took place. The wind at the time was south-west, light, weather cloudy, barometer 30·1, thermometer 80°. The sensation resembled a ship scraping a pebbly bottom, and the vibration of the ship was very great."

H.R.H. the Prince of Wales has decided that the Colonial and Indian Exhibition shall close on the evening of Wednesday, November 10.

We hear that the first of the Grocers' "Medical Research Scholarships" has been awarded to Dr. Sims Woodhead, of Edinburgh. The value of the award is 250*l*.

"Philips' Planisphere, showing the Principal Stars visible for every Hour in the Year" (London: George Philip and Son), is perhaps the best means yet devised of getting a preliminary acquaintance with the aspect of the sky. It consists of a movable disk representing the celestial sphere, and a fixed horizon corresponding to the latitude of London. On the edge of the disk are inscribed the signs of the zodiac, the months and days of the year; on the horizon, the hours of the day and night. By merely rotating the disk until any given day and hour are brought to coincide, the stars above the visible horizon of London at that time come into view. A continuance of the movement from east to west exhibits ten apparent revolutions of the stars. Each successive group on the chart rises and sets in its proper order, while its distance from the sun at any selected date can be estimated by following a line drawn from the celestial pole to the corresponding section of the disk. Its point of intersection with the ecliptic indicates the position of the sun. The same lines show the differences between solar and sidereal time throughout the year. A very little attention will enable the student to distinguish the circumpolar stars, to track the course of the Milky Way among the constellations, and to acquire some rough notion of the magnitudes of the principal stars. Quite a little stock of uranographical information, in short, is concentrated in this ingenious toy.

A careful revision of the hydrographic map of the Lake of Geneva has been lately made by M. Hornlimann, soundings being taken by the steel-wire method. It is shown that between Lutry, Ouchy, Evian, and La Tour-ronde the bottom of the lake is absolutely horizontal. For distances of 2 kilometres and more the differences of depth did not exceed 0·10 to 0·15 m. (being thus quite within the limits of observational error. The point of greatest depth was met with in the line which joins the mouth of the Flon, below Lausanne, and the church of Evian, 7 km. from the Swiss side and 5 from that of Savoy. This was 310 m. (say 1034 feet). The bottom of the lake is here about 219 feet above the sea.

THE earthquakes still continue in North America. Fresh shocks were felt at Charleston and other places in the south at five o'clock on the afternoons of the 27th and 28th inst. Shocks of earthquake were also at the same hour distinctly felt in Columbia, Augusta, and Savannah.

A SHARP shock of earthquake occurred at Constantinople at half-past four on the morning of the 26th inst., but no damage was done. At about a quarter to five on the same morning two sharp shocks in rapid succession were felt in Smyrna and the neighbourhood.

AN earthquake was felt at Aumale on the 22nd inst. at 11 a.m.; four shocks were reported.

THE White Island volcano, in the Bay of Plenty, off the North Island coast, New Zealand, is in active eruption, and sending forth a vast column of flame and smoke, rising to a height of 100 feet.

THE Ceylon branch of the Royal Asiatic Society has decided to print *in extenso* a translation of Prof. Virchow's monograph on the Veddas. An abridgment will appear in the forthcoming number of the Society's *Proceedings*.

FROM the Cambridge University Press the following new publications are announced:—"A History of the Theory of Elasticity and of the Strength of Materials, from Galilei to the Present Time," vol. i. "Galilei to Saint-Venant, 1639–1850," by the late I. Todhunter, D.Sc., F.R.S., edited and completed by Karl Pearson, M.A. "Lectures on the Physiology of Plants," by S. H. Vines, M.A., D.Sc., Fellow of Christ's College. "Travels in Northern Arabia in 1876 and 1877," by Charles M. Doughty, of Gonville and Caius College (with illustrations). "The Scientific Papers of the late Prof. J. Clerk Maxwell," edited by W. D. Niven, M.A.

MESSRS. CROSBY LOCKWOOD AND CO. announce the following books for the forthcoming season:—"Modern Engines and Boilers: Marine, Locomotive, and Stationary," by Walter S. Hutton, Civil and Mechanical Engineer (with upwards of 300 illustrations). "The Works' Manager's Hand-book of Modern Rules, Tables, and Data, for Civil and Mechanical Engineers, &c.," by Walter S. Hutton (third edition). "The Portable Engine, in Theory and Practice," by W. D. Wansbrough (with numerous illustrations). "Expansion of Structures by Heat," by John Keily, C.E., late Indian Public Works and Victorian Railway Departments. "Safe Railway Working," by Clement E. Stretton, C.E. "Drainage of Lands, Towns, and Buildings," a practical treatise, being an abridgment of the works of the late G. D. Dempsey, C.E., with extensive additions by D. Kinnear Clark, M.Inst.C.E. "Trusses of Wood and Iron: Practical Applications of Science in determining the Stresses, Breaking Weights, Safe Loads, Scantlings, and details of Construction," by William Griffiths. "Shoring and its Application," a manual for students, by George H. Blagrove (with numerous illustrations).

H. K. LEWIS has in preparation "An Introduction to Practical Bacteriology," by Edgar M. Crookshank, M.B. Lond., F.R.M.S., Demonstrator of Physiology, King's College, London (2nd edition); also, by the same author, "Photographs of Bacteria: an Investigation into the Value of Photography for delineating Preparations of Bacteria" (illustrated with 50 permanent autotypes and numerous wood engravings).

THE following publications are announced by Messrs. W. and R. Chambers:—"Natural History: its Rise and Progress in Britain, as developed in the Life and Labours of Leading Naturalists," by Prof. H. Alleyne Nicholson (Aberdeen). This will form vol. i. of a series called "Chambers's British Science Biographies," of which series the second volume, by Prof. Lapworth (Birmingham), will cover the field of British Geology. Other new books by the same publishers are: "Recent Travel and Adventure," with illustrations; and "Lessons in Elementary Dynamics," by H. G. Madan, M.A., Science Master in Eton College.

THE grease of sheep's wool, a substance hardly utilised hitherto, may now find use, according to a process lately brought before the French National Society of Agriculture by M. Rohart. He finds that, brought to its point of fusion, it very readily absorbs certain sulphur-compounds; thus it will fix as much as 100 times its volume of sulphuretted hydrogen; and so treated it becomes saponifiable in the cold state. M. Rohart presented some excellent soap made from the grease. The operation required takes less than an hour, whereas soaps with a base of soda generally take 6 to 8 hours in their production. Moreover, the saponification can be obtained completely without caustic alkalies, and simply with alkaline carbonates; a new scientific fact, applicable to all fatty matters when sulphurised. Thus a great economy is possible. This sulphurised soap is recommended by M. Rohart, *inter alia*, for use in vine-cultivation.

IN a recent thesis on the modification of plants by climate, Mr. Crozier, of Michigan University, considers it established "that as plants move from the locality of their largest development towards their northern limit of growth, they become dwarfed in habit, are rendered more fruitful, and all parts become more highly coloured, Their comparative leaf surface is often increased. their form modified, and their composition changed. Their period of growth is also shortened, and they are enabled to develop at a lower temperature."

THE successful cultivation, since 1884, of the Ramie or China grass plant (*Boehmeria nivea*) on the Champ-de-l'Air at Lausanne (altitude 520 m.), by Prof. Schnetzler, is an interesting fact in botany. This shrub, a native of China and Sumatra, has been grown in the south of the United States and of France for thirty years. Recently it has been introduced into Algeria. There is of course a striking difference in the conditions of temperature between Lausanne and the places in Asia where Ramie is grown. While the latitude of the latter is from 15° to 35°, that of Lausanne is 46° 31′. The mean temperature at Lausanne is 9°·5 C. Last winter the plants underwent long periods of great cold; in one case, *e.g.*, the thermometer being below zero for 124 hours, with a minimum on the ground of – 12°·5 C.

THE question of telephony *v.* telegraphy has been recently discussed by a well-known German electrician, Dr. Wietlisbach. The chief hindrance to the use of the telephone for long distances is, he points out, of a financial, not of a technical, nature. A telephone-line 2000 km. long costs considerably over a million marks. It is still possible to speak very well this distance; but even supposing the line were in constant use day and night, the receipts must be 5 marks (say shillings) a minute to make it pay. In telephone work, however, the line is in use only a few hours daily; hence a short conversation would cost at least 50 marks (2*l.* 10*s.*). That is, of course, too dear for ordinary traffic. The telegraph works, with almost the same speed, more than ten times more cheaply. Thus the question as to rivalry between telephone and telegraph finds its settlement. The telephone, up to about 500 km. distance (say 310 miles), will more and more displace the telegraph, and find an extension which the telegraph would never reach. But for greater distances the telegraph must keep the upper hand. Thus telephone and telegraph are really not rivals, but fitted to supplement each other.

WE have received the report for the past year of the School of Mines, Ballaarat, an institution which its Council believe is in a fair way of becoming the leading School of Science in the colony of Victoria. The increasing number of the students who avail themselves of the constantly extending opportunities for instruction offered by the School renders additional teaching power a necessity, and this requires, first of all, an increased income. It is to be hoped that the Council have been successful in its request for double the present annual subsidy from the Government. A School of Mines is perhaps the most immediately useful and paying one a young community can have. A new and enlarged museum has been added to the School, and Mr. Oddie, the Vice-President, has undertaken at his own expense to erect and equip an astronomical observatory. Two rooms, each 16 feet by 18, were erected when the report was drafted, and in one of these a 12½-inch Newtonian reflector has been placed in position. The second room is to be utilised for spectrum analysis, solar physics, testing specula, &c. A system of meteorological observations with the latest instruments, in connection with the Melbourne Observatory, has also been introduced. A recent task of the School authorities, in which many of our readers may be presumed to be interested, is the collection of rocks and minerals representing the geology of Western Victoria in the Colonial and Indian Exhibition. At the close of the Exhibition it will be presented to the Museum of the Geological Survey of Great Britain. The reports of the individual professors show progress in almost every direction—in the number of students, of subjects taught, and of average attendances of each student. We observe that the benefits of the School are largely extended by means of a concession from the Government railways permitting students to travel over long distances at exceedingly low fares. This is one of those concessions which cost so little, yet are worth so much, and which are more common in the United States or the colonies than they are in England.

IN a very interesting paper contributed to the *Bulletin* of the Essex Institute of Salem, Mr. A. McFarland Davis writes on some of the games of the Indian tribes of North America. Several of these are described at considerable length, mostly from the early Jesuit records. Lacrosse is the first and most important of these; it was, as it is now, purely a game of skill, but it was a contest of grave importance, not a mere pastime, and was domesticated over a wide extent of territory. Another very widely-spread game was "platter," which was played with dice, and was wholly a game of chance; the third was a game of chance and skill combined, and in some of its forms was exceedingly complicated. It was called "straws," because a bundle of straws was divided, the game turning on the odd or even numbers in the heaps. It resembles the celebrated Chinese game of *fantan*, which forms one of the principal sources of revenue of one European colony in the East. Sundry other games not so widely spread as these are also described by Mr. Davis. The extraordinary importance attached to these games, the strange and solemn ceremonies with which they were frequently initiated, give them an interest in the eyes of anthropologists beyond that of mere curiosity.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*) from India, presented by Mrs. Faulkner; two Golden Eagles (*Aquila chrysaetos*) from the Isle of Mull, Argyllshire, Scotland, presented by His Grace the Duke of Argyll, K.G., F.Z.S.; a Stock Dove (*Columba œnas*), British, presented by Mr. Charles Whymper, F.Z.S.; an Anaconda (*Eunectes murinus*) from South America, deposited; a Lesser White-nosed Monkey (*Cercopithecus petaurista*) from West Africa, purchased; a Maned Goose (*Bernicla jubata*) from Australia, received in exchange; a Spotted Hyæna (*Hyæna crocuta*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

STELLAR PHOTOMETRY.—Mr. Chandler, of Cambridge, U.S., presented an interesting and important paper to the Section of Mathematics and Astronomy of the American Association at the recent meeting, the title being "A Comparative Estimate of Methods and Results in Stellar Photometry." According to the account of the paper given in *Science* (vol. viii., No. 187), Mr. Chandler took for his text the general statement that instrumental photometry had thus far proved a failure; that is, it had not developed a more uniform scale than Argelander's, nor had the accuracy of individual determinations been increased, but they were, on the contrary, far more uncertain than the old differential naked-eye estimates. In support of his views Mr. Chandler showed that, for stars of Argelander's scale between magnitudes 2 and 6, the photometric catalogues of Seidel, Peirce, Wolf, Pickering, and Pritchard differed among themselves as much in their measures of what Argelander called a difference of one magnitude, as they did in their measures of his successive magnitudes. Their average values of the logarithm of the light-ratio for one of Argelander's magnitudes between 2 and 6, ranged between ·30 and ·38, about ·35 for the mean of all the above-mentioned catalogues. Between magnitudes 6 and 9 of Argelander's scale, the catalogues of Rosén and Ceraski averaged about ·35 for the light-ratio, while Pickering's late results with the meridian photometer gave (between magnitudes 6 and 8·5) ·48 instead of ·35 for this ratio. Coming to accidental errors, Mr. Chandler showed that, from a discussion of the naked-eye estimates of Gould, Sawyer, and himself, the probable error of a single estimate was a little over ± ·06 of a magnitude when the stars were at considerable distances from each other, and about ± ·05 of a magnitude when near; while the probable error of a single measure in the "Harvard Photometry" was ± ·17 of a magnitude, and in the "Uranometria Oxoniensis" about ± ·10 of a magnitude. The large residuals in the "Harvard Photometry" appear to arise, according to Mr. Chandler, from the wrong identification of stars in many cases, one instance being cited where no bright star exists in or near the place given in the observing-list, on account of a misprint in the *Durchmusterung*, and yet some neighbouring star was observed on several nights for it. The author, in conclusion, pointed out that we must obtain better results from photometers if we ever expect to use their results for the detection or measurement of variable stars, since several variables have been detected, and their periods and light-curves well determined by eye-estimates, whose whole range of variation is no greater than the whole range of error in the photometric observations upon a single star with the meridian photometer.

A NEW OBSERVATORY IN LA PLATA.—In the *Bulletin Astronomique*, tome iii. Août 1886, M. Mouchez gives an account of a new Observatory which is being built in the town of La Plata. The Observatory appears to have a remarkably good instrumental equipment, including a telescope of 0·80m. aperture, an "équatorial coudé" of 0·43m. aperture, a meridian instrument of 0·22m. aperture, an apparatus for celestial photography of the same dimensions as that of MM. Henry at the Paris Observatory, a Thollon spectroscope with objective of 0·25m. aperture, besides a collection of geodetical instruments. The new Observatory is under the direction of M. Beuf, lately an officer in the French Navy, and his first efforts are to be directed towards the carrying out of a geodetic survey of the vast territory of the province, including the measurement of an extensive meridian arc in the plains of Chaco and Patagonia. The measurement of this arc will supply a want which has been long felt by geodesists, and will give new and valuable data for an increase in our knowledge of the terrestrial spheroid. He trusts that M. Beuf will be successful in this arduous and important undertaking, and also that he will have sufficient energy, and be supplied with a sufficient staff of observers, to work to advantage the numerous and powerful instruments which the Observatory possesses.

HELIOMETRIC OBSERVATIONS OF THE PLEIADES.—In the note on this subject, printed in last week's "Astronomical Column," the words "since 1860" should read "since 1840," the latter being the date of Bessel's determinations resulting from his observations with the Königsberg heliometer made during the years 1829-41.